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Engineering Enrollments and Degrees, 1949-55

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ENGINEERING ENROLLMENT in institutions of higher education in the United States and its outlying parts [1] has increased for 4 consecutive years (see table 1). There were 46.9 percent more engineering students (undergraduates and graduates) in 1955 [2] than in 1951, when engineering enrollment and higher educational enrollment in general dropped to a post-World War II low. During this period total higher educational enrollment increased 28.6 percent,[3] and male enrollment 27.6 percent. Engineering data are compared with data on male students because engineering enrollment is preponderantly male. In 1955, for example, women students accounted for less than one-half of one percent of the total engineering enrollment.

Engineering enrollment for each of the past 4 years has increased at an accelerated rate—the gains for the 4 years 1952 to 1955, respectively, being 6.6, 9.5, 10.9, and 13.5 percent. In view of the great demand for engineering skills, these gains would appear to be significant. Furthermore, the 13.5-percent increase in 1955 compares favorably with (1) the increase of 11.4 percent in male enrollment in general, and (2) an increase of 3.6 percent in the male population 18-21 years of age.

The engineering data contained in this article are taken from the surveys of engineering enrollments and degrees conducted annually since 1949 by the Office of Education in cooperation with the American Society for Engineering Education. In these surveys, data are gathered from all institutions which meet the following criteria: They must be listed in the higher education directory;[4] and they must report the conferral of engineering degrees in the general degree survey of the Office of Education.[5] The tabulations for 1955 included data for the 217 insti-

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[1] Engineering degrees are conferred by institutions in Alaska, Hawaii, and Puerto Rico.

[2] All enrollment data presented in this article are for the fall of the year cited.

[3] See William A. Jaracz, *Fall Enrollments in Higher Educational Institutions, 1955* (Office of Education, Circular No. 460).

[4] See Theresa Wilkins, *Education Directory, Part III, 1954–55, Higher Education* (Office of Education).

[5] See Mabel C. Rice and Neva Carlson, *Earned Degrees Conferred by Higher Educational Institutions, 1954–55* (Office of Education, Circular No. 461).

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Table 1.—Engineering enrollment in higher educational institutions in the United States and its Outlying Parts, by level: Fall of 1949 to fall of 1955

Fall of	Total	Enrollment leading to bachelor's degree	Graduate enrollment		
			Total	Leading to master's degree *	Leading to doctor's degree
1955	243,390	221,448	21,942	18,779	3,163
1954	214,414	193,692	20,722	17,441	3,281
1953	193,333	171,725	21,608	18,607	3,001
1952	176,549	156,080	20,469	17,539	2,930
1951	165,637	145,997	19,640	16,765	2,875
1950	180,262	161,592	18,670	15,869	2,801
1949	219,712	201,927	17,785	15,242	2,543

* Includes master's and other predoctoral.

Table 2.—Engineering degrees granted by higher educational institutions in the United States and its Outlying Parts, by level: 1948–49 to 1954–55

Year	Total	Bachelor's	Graduate degree		
			Total	Master's *	Doctor's
1954–55	27,672	22,589	5,083	4,484	599
1953–54	27,003	22,236	4,767	4,177	590
1952–53	28,499	24,164	4,335	3,743	592
1951–52	35,013	30,286	4,727	4,141	586
1950–51	47,635	41,893	5,742	5,156	586
1949–50	58,130	52,732	5,398	4,904	494
1948–49	50,415	45,200	5,215	4,798	417

* Includes master's and other predoctoral.

tutions which met these criteria—a 100-percent response.[6] Since some of the schools that do not meet the foregoing criteria—for example, liberal arts colleges which serve as "feeder" schools for engineering institutions—enroll engineering students, the enrollment data presented here are an understatement.

[6] See William A. Jaracz and Henry H. Armsby, *Engineering Enrollments and Degrees, 1955* (Office of Education, Circular No. 468) for the formal publication based on this study. See William A. Jaracz and Henry H. Armsby, "Engineering Enrollments and Degrees, 1955," *The Journal of Engineering Education* (February 1956), for a presentation restricted to those schools which are accredited in at least one engineering curriculum by the Engineers' Council for Professional Development. The *Journal* article contains data for individual institutions in somewhat greater detail with respect to level of enrollments and degrees than the Office circular. The circular contains data on enrollments and degrees in specific engineering curriculums, not found in the *Journal* article.

Undergraduate Enrollment

Inasmuch as undergraduate engineering enrollment constitutes the bulk of total engineering enrollment (91.0 percent in 1955), it too has increased for 4 consecutive years—and at an accelerated rate (see table 1 and figure 1A).

In 1955, 32.9 percent of all undergraduate engineers were classified as freshmen. The remainder were distributed as follows: sophomores, 22.9 percent; juniors, 17.8 percent; seniors, 14.1 percent; 5th-year students, 1.3 percent; and part-time and evening students, 11.0 percent. Although the number of engineering students at all undergraduate levels increased, the relative importance of each level remained essentially constant, as it has since 1952. In the post-World War II years prior to 1952, however, there was no stability in the relative importance of the several levels of undergraduate engineering enrollment because of (1) the annual declines in the enrollment of engineering freshmen from 1946 to 1950, and (2) the increases in enrollment of veterans who resumed interrupted educational careers as upperclassmen.

An examination of enrollment data reveals that first-time [7] total male enrollment declined annually after 1946, dropping to a low in 1951, and that engineering freshman enrollment also declined annually after 1946 but dropped to a low 1 year earlier, in 1950.[8]

Both types of enrollment have increased, however, since 1951, with the latter registering somewhat greater gains in each year except 1954. There were 11.2 percent more engineering freshmen enrolled in 1955 than in 1954. The increase in total male first-time enrollment was 8.7 percent. For the last 4 years engineering freshmen have constituted about one-sixth of the total male first-time enrollment and approximately one-tenth of the total (male and female first-time enrollment).

To a great extent, undergraduate engineering enrollment is concentrated among three engineering curriculums: Electrical, mechanical, and civil. During the past 7 years, from 54.0 percent (in 1953) to

[7] The comparison is made between engineering *freshmen* and *first-time* male students in the absence of identical data.

[8] References to data before 1949 are based on annual reports of the American Society for Engineering Education, published in *The Journal of Engineering Education*. Although the data contained in these reports are restricted to schools accredited in at least one engineering curriculum by the Engineers' Council for Professional Development, the statements made in this article are applicable to all schools.

60.6 percent (in 1949) of all undergraduate engineers were enrolled in these three curriculums. Electrical engineering superseded mechanical as the dominant field in 1954, with civil engineering a relatively weak third. In 1955, the proportion of each of these three engineering curriculums in the total undergraduate engineering enrollment was: Electrical, 23.3 percent; mechanical, 21.4 percent; and civil, 11.9 percent.

The number of undergraduate engineering students who have not designated the engineering discipline which they plan to pursue has been large, particularly among evening students. From 35.5 percent (in 1952) to 45.3 percent (in 1954) have been reported as being unclassified. The figure for 1955 was 42.3 percent. The freshman class has also had a relatively high incidence of unclassified students, ranging from 23.0 percent (in 1950) to 29.7 percent (in 1955). Traditionally about one-half of the engineering schools report unclassified enrollment.

Undergraduate Degrees

Conferrals of the bachelor's degree in engineering declined annually (see table 2 and figure 1B) from 1950, the all time record year, through 1954. The large number of conferrals in 1950 can be attributed to the influx of returning veterans into the freshman class of 1946 and the declines from 1951 through 1954 to the declines in freshman enrollment from 1941 through 1950. Fewer bachelor's degrees in engineering were granted in 1954 than in any other post-World War II year because by 1950 freshman engineering enrollment was no longer affected to any great extent by returning veterans. Inasmuch as freshman engineering enrollment has increased each year since 1951, conferrals are expected to increase in the years immediately ahead. That is to say, the curve in figure 1B for the years 1956 to 1958 would resemble the last three segments of the curve of figure 1A.

The number of engineering degrees conferred in 1955 [9] was 1.6 percent larger than in 1954. This increase, coming at a time when the total number of first degrees conferred on male students declined (by 2.1 percent), has raised the ratio of first engineering degrees to total first degrees—from 11.8 (in 1954) to 12.3 percent (in 1955). Before 1955, this ratio had declined annually from 16.0 percent in 1950 to 11.8 percent in 1954.

[9] All degree data contained in this article are for the 12-month period ending June 30 of the year cited.

Approximately two-thirds of all engineering degrees are conferred in three fields: Electrical, mechanical, and civil. During the past 7 years, the proportion has ranged from 62.3 percent (in 1954) to 67.1 percent (in 1950). The figure for 1955 was 64.7 percent. Within these three curriculums, more degrees were granted in each year from 1949 to 1955 in mechanical engineering than in electrical engineering and fewest in civil engineering. This situation, however, is expected to change, as undergraduate enrollment is now higher in electrical than in mechanical engineering. In 1955, 26.0 percent of all bach-

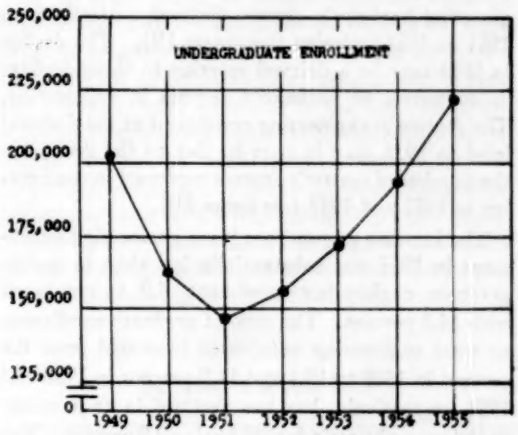

Figure 1A.—Undergraduate enrollment in engineering in higher educational institutions in the United States and its Outlying Parts: Fall of 1949 to fall of 1955.

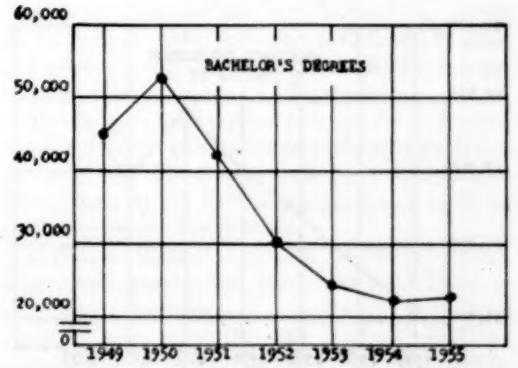

Figure 1B.—Bachelor's degrees granted in engineering by higher educational institutions in the United States and its Outlying Parts: Year ending June 30, 1949, to year ending June 30, 1955.

elor's degrees in engineering were conferred in mechanical engineering; 21.5 percent in electrical; and 17.1 percent in civil.

Graduate Engineering Enrollment

In every postwar year, except 1954, the total graduate engineering enrollment has increased. (See table 1). Enrollment leading to a master's degree declined only in 1954 and enrollment leading to a doctoral degree in engineering only in 1955 (see figures 2A and 3A). The steady annual increase in engineering enrollment at the master's level through 1954 is difficult to explain since the number of engineering bachelor's degrees declined annually from 1951 to 1954 inclusive (see figure 1B). The decline in 1954 may be a delayed reaction to these declines in conferrals of bachelor's degrees in engineering. The decline in engineering enrollment at the doctoral level in 1955 may in part be due to the decline in the number of master's degrees conferred in engineering in 1952 and 1953 (see figure 2B).

The increase in total graduate engineering enrollment in 1955 was substantially less than in undergraduate engineering enrollment, 5.9 as compared with 14.3 percent. The ratio of graduate enrollment to total engineering enrollment increased from 8.1 percent in 1949 to 10.4 and 11.9 percent in 1950 and 1951, respectively, but has declined in each subsequent year, the ratio for 1955 being 9.0 percent. The great demand for engineers, as is evidenced by the advertisements in the daily press, is one of the major factors in this development.

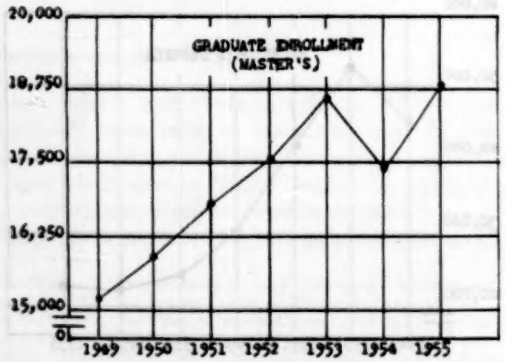

Figure 2A.—Enrollment of engineering students pursuing work leading to a master's or other predoctoral degree in higher educational institutions in the United States and its Outlying Parts: Fall of 1949 to fall of 1955.

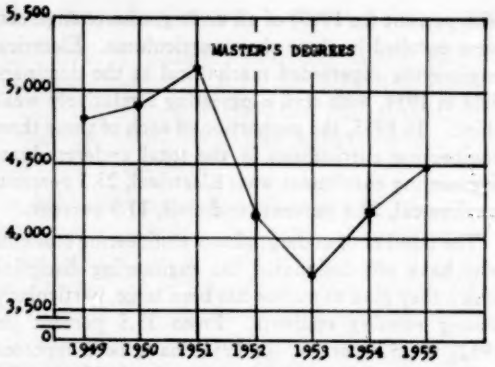

Figure 2B.—Master's and other predoctoral degrees granted in engineering by higher educational institutions in the United States and its Outlying Parts: Year ending June 30, 1949, to year ending June 30, 1955.

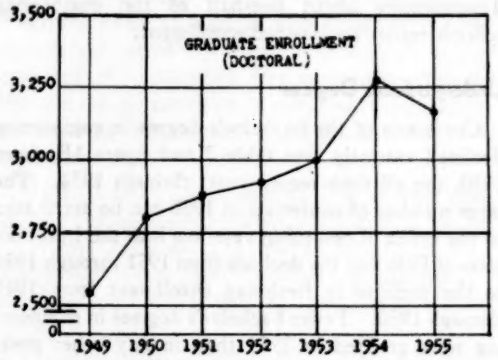

Figure 3A.—Enrollment of engineering students pursuing work leading to a doctoral degree in higher educational institutions in the United States and its Outlying Parts: Fall of 1949 to fall of 1955.

A large proportion of the enrollment leading to a master's degree in engineering are evening students. The proportion has, however, declined of late: From 57.8 percent in 1951 to 48.9 percent in 1955. A considerably smaller proportion of doctoral students in engineering are evening students: Fewer than one-fourth in the 3-year period 1952–54, and only about one-sixth in 1955. The considerable decline in the number of such students in 1955 contributed greatly to the decline in doctoral engineering enrollment as a whole.

Chemical engineering supersedes civil as one of the "big three" in total graduate engineering enrollment. Although enrollment in civil engineering at the master's level is larger than in chemical engineering, the enrollment in chemical engineering at the

doctoral level far exceeds that in civil. This situation stems from the greater urgency in obtaining a doctorate in chemical engineering. In 1955, these three engineering curriculums accounted for 56.9 percent of all graduate engineering students, the lowest ratio for the past 7 years, the highest having been 59.6 percent (in 1950). Specifically, in 1955, 29.6 percent of all graduate engineering students were enrolled in electrical engineering, 16.0 percent in mechanical engineering, and 11.3 percent in chemical engineering. The ratio for graduate enrollment in electrical engineering is almost twice as high as that for mechanical, whereas in undergraduate enrollment, the ratio for electrical engineering was not much higher than that for mechanical. The foregoing would seem to indicate not only the increasing importance of electrical engineering in our society but also the importance of advanced training in it.

Graduate Engineering Degrees

The number of master's degrees conferred in engineering has increased in the past 2 years, after declining in 1952 and 1953 (see figure 2B). The 1955 increase of 7.3 percent in such conferrals compares favorably with a 1.6 percent increase in the total number of master's degrees conferred on males.

In 1955, 599 engineering doctorates were conferred and 590 in 1954 (see table 2), an increase of 1.5 percent, which compared favorably with a decline of 2.0 percent in the total number of doctorates conferred on males. It is noteworthy that, in the face of annual increases in doctoral enrollment through 1949 (see figure 3A), the number of engineering doctorates conferred has remained relatively stable from 1951 to 1955 inclusive (see table 2 and figure 3B), fluctuating between 586 (in 1951) and 599 (in 1955).

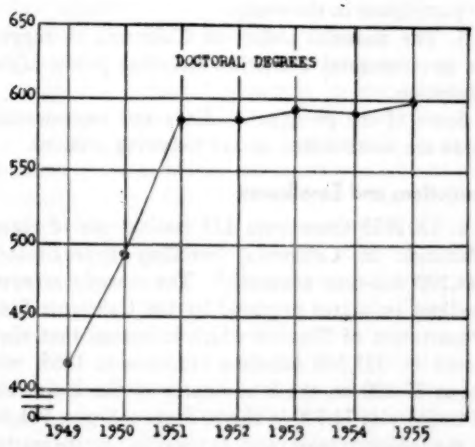

Figure 3B.—Doctoral degrees granted in engineering by higher educational institutions in the United States and its Outlying Parts: Year ending June 30, 1949, to year ending June 30, 1955.

Conclusion

There appears to be sufficient evidence to warrant the conclusion that engineering, as a higher educational field of study, has fared well when compared with the totality of higher educational disciplines. This does not mean, of course, that the Nation's institutions of higher education are turning out engineers in numbers sufficient to satisfy the needs of a technological economic system. As a matter of fact, the reverse is true, according to the analyses of the engineering manpower situation. Whether the larger higher educational enrollments projected for the future will result in a sufficient number of engineering graduates to satisfy the demand is problematical. Conceivably, engineering will have to absorb a still greater share of the facilities of what inevitably must become a larger higher educational plant.

Scholar's Book List

THE ASSOCIATION of American University Presses is proceeding with plans to provide more than 175,000 persons in four academic classifications with a descriptive catalog containing information on the books newly published by the university presses. The four classifications are: Humanities, about 50,000 persons; social sciences, about 40,000 persons; biological and medical sciences, about 50,000 persons; physical sciences, about 35,000 persons.

Through this mass mailing program the association hopes to increase greatly the sales of books published by the presses as well as to make persons in the four fields aware of the new publications and facilitate their acquisition of such books.

The Association of American University Presses, a nonprofit organization, consists of some 40 book-publishing departments or organizations owned and operated by or under the aegis of as many colleges and universities in the United States and Canada. It was formally organized in 1937 to raise the standards of university press publishing, offer a variety of services to the member presses, and help newly organized presses achieve high standards.

Restudy of the Needs of California in Higher Education

By T. R. McCONNELL*

CALIFORNIA is one of the States in which the enrollment in higher education over the next decade will very likely increase at a rate much greater than the national average. To determine the magnitude and character of the necessary expansion in facilities the legislature in 1953 authorized a comprehensive survey of the State's educational needs at the post-high-school level and of the resources available to meet them.

Higher Education Surveys in California

Statewide planning in higher education in California goes back at least to 1920, when a special legislative committee recommended further development of the then 10-year-old junior college movement, the transformation of the 2-year normal schools into 4-year teachers colleges, and a study of the relationships of the University of California and the State colleges.[1]

In 1947, the legislature authorized a comprehensive survey of publicly supported higher education. One of the principal contributions of the report of this study, which appeared in 1948,[2] was the proposal of both common and differentiated functions for the public junior colleges, the State colleges, and the University of California.

The report also recommended the continuation of the voluntary agency, established in 1945, for the coordination of the State colleges and the University of California. This agency was the liaison committee, to which the regents of the university and the State board of education (the governing body of the State colleges) each appointed three of its members and its chief executive officer. In 1951 the legislature made an appropriation for the committee; and the joint staff, composed of two specialists in higher education, one for the State colleges and one for the university, came into being.

Since the legislature, in authorizing the new survey in 1953, called for a reexamination of the 1948 report (popularly called the Strayer report) in the light of new enrollment prospects, economic conditions, and educational needs, the latest report is entitled, *A Restudy of the Needs of California in Higher Education.*[3] It covered the following general problems:

1. Potential enrollment to 1965 in publicly supported institutions of higher education and in independently controlled colleges and universities, together with the physical facilities necessary to care for the larger student bodies.

2. The functions and educational programs of the public junior colleges, the State colleges, and the University of California, with particular reference both to diversification of educational opportunities and to differentiation of responsibility among the several groups of public institutions; and the role of independent institutions in statewide facilities for higher education.

3. The government and administration of public higher education, with particular reference to coordination and economy in carrying out an overall educational plan for the State.

4. Expenditures for various types and levels of educational services in the public institutions and in the private colleges and universities which chose to participate in the study.

5. The financial ability of California to support its governmental activities, including public higher education.

Some of the principal findings and recommendations are summarized in the following sections.

Institutions and Enrollments

1. In 1953 there were 135 institutions of higher education in California, enrolling approximately 148,200 full-time students.[4] The restudy accepted medium estimates prepared by the California State Department of Finance which indicated that there would be 325,300 full-time students in 1965, with about 57,400 on the 8 campuses of the University of California; 72,300 in the 10 State colleges; 104,500 in the junior colleges; and the rest in private institu-

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[1] *Report of the Special Legislative Committee on Education.* (Sacramento: California State Printing Office, 1920.)

[2] *Report of a Survey of the Needs of California in Higher Education*, submitted to the liaison committee of the regents of the University of California and the State Department of Education (Berkeley, Calif.), by the committee on the conduct of the study (George D. Strayer, *chairman;* Monroe E. Deutsch; and Aubrey A. Douglass), 1948.

[3] Prepared for the liaison committee of the regents of the University of California and the California State Board of Education by the joint staff, T. C. Holy and H. H. Semans, and the chief consultant, T. R. McConnell. Sacramento, California State Department of Education, 1955, 473 pp.

[4] Students carrying 12 or more credit hours.

tions if they should be able to accommodate them.

The restudy staff knew that these were conservative estimates, but they proved to be even more so than had been anticipated. For example, the department of finance recently increased its medium estimate of the fall 1961 enrollment in the State colleges from 54,300 to 65,000. In making the statewide enrollment predictions, it was assumed that the privately controlled institutions would care for the same proportion of the total student body of higher education in 1965 as at present. However, an inquiry addressed to these institutions revealed that they almost certainly will not be able to carry this share of the load. To the extent to which they enroll a smaller percentage of the total student load, the burden of the public institutions will be increased.

Increased Facilities

2. In order to care for the greater number of students, present junior colleges should be enlarged, and new ones should be established in areas not now adequately served where sufficient population and adequate financial resources would justify additional institutions; and the present campuses of the State colleges and the University of California should be expanded as needed. No new campuses of the university and no new State colleges should be established until 1965, but this recommendation should be reviewed in 1960 in time to provide new campuses or new institutions, if necessary and desirable, to care for enrollment after 1965. In view of the decidedly conservative estimates of enrollment this timetable may need to be revised.

The restudy report gives several reasons for expanding the present institutions instead of creating new ones immediately. One of the most compelling is the importance of maintaining the tripartite scheme of public higher education which lends great strength to the California system. The 61 public junior colleges constitute the basic means of extending the opportunity for higher education widely among the youth of California at minimum expense to them, their parents, and the State. These institutions have proved their ability to prepare students for successful work in the 4-year institutions to which many transfer; in addition, they offer a wide range of "terminal" technical or semiprofessional curriculums which would not be available in other institutions or less effectively provided. The restudy looked with disfavor both on extending junior colleges into 4-year institutions and on transferring to the State government the entire cost of lower division education by creating State colleges before junior colleges are established in appropriate areas.

The report describes the enrollment capacities of the present physical plants of the public institutions and of the private institutions which wished to participate in this part of the survey. It also estimates the additional plant that will be necessary to care for projected increases in enrollment to 1965. These capacities and estimated future needs were based on certain space requirements for classrooms, teaching and research laboratories, offices, and other facilities. They were also based on utilization standards, which were admittedly severe and probably not attainable in many instances, for reasons pointed out in the report. The utilization recommended for classrooms was 36 hours per week at 67 percent of capacity, and for teaching laboratories, 24 hours per week at 80 percent of capacity. It was emphasized that these "standards" are averages and they cannot be applied rigidly to all instructional facilities.

The University and the State Colleges

3. The University of California and the State colleges should emphasize upper division and graduate education without, however, abandoning their lower divisions.

System of Scholarships

4. As a means of equalizing educational opportunity for superior students, a State scholarship system should be established with the following provisions: The grants should be based on evidence of merit and need, and should not exceed $600 (with an average of $400); applicable to tuition, fees, and/or subsistence at either public or private institutions; and 40 percent of the total number of annual awards should be made to students preparing to teach.

At this point it may be noted that the 1955 legislature established a State scholarship system along somewhat different lines. The act provides for a maximum of 2,560 scholarships, when the plan is in full operation in 1959–60, "of $600 or an amount equal to the tuition or necessary fees, or both tuition and fees, for the academic year." Unlike the restudy's proposal, no part of an award may be used for subsistence.

Residence Halls

5. Additional residence halls should be constructed at both the university and the State colleges, which have lagged seriously behind public institutions in

other States in providing satisfactory student housing.

It may be added here that the 1955 legislature voted to submit to the electorate a bond issue of $200,000,000 for the State's building program, including $60,000,000 for the State colleges, a part of which is designated for residences. The regents of the university have set aside about $9,000,000 from reserve funds for investment in residences on the several teaching campuses.

Differentiation of Functions

6. As indicated above, the Strayer report of 1948 attempted to differentiate the vocational responsibilities of the three groups of public institutions by stating, "It is the level between the technical training of the junior college and the professional and research departments of the University towards which the occupational curricula of the State colleges are pointed." This specific use of the term "occupational" was unusual, but it has since come to be generally used in California to characterize the wide variety of occupational programs that the State colleges, transformed in 1935 from teachers colleges into multipurpose institutions, have established.

After appraising the Strayer committee's principle of differentiation, the restudy staff concluded that it was, in general, a sound means of distinguishing the functions and programs of the three segments of public higher education, and that continued differentiation was essential if a sufficiently diversified statewide program of higher education is to be attained with reasonable economy and efficiency.

With the assistance of special consultants and advisory committees, the restudy staff explored the differences in objectives and educational programs that might be planned appropriately in the junior colleges, the State colleges, and the University of California in the fields of public administration, business administration, nursing, home economics, teacher education, and social work. The joint staff had previously made a comparable study in engineering, and one in agriculture has recently been completed.

The restudy also recommended that, under specific conditions, the State colleges should be authorized by their governing boards to give master's degrees in certain occupational fields, as well as in related arts and sciences. (The colleges now offer master's degrees only for teaching service.) However, the restudy recommended that at least until 1965, and also thereafter unless new and compelling conditions should arise, doctoral degrees should be awarded exclusively by the University of California.

Organization and Administration

7. The report emphasized the necessity of treating the State colleges, on the one hand, and the University of California, on the other, as integrated systems. With this principle as a criterion, the staff appraised the effectiveness of the university's governing board as a policymaking body, the appropriateness of its organization, and the organization and efficiency of the university's statewide administration. It reviewed the extent to which the statewide administration had delegated adequate responsibility and authority to the heads of the several campuses of the university while retaining its central responsibility for formulation of policy (with appropriate participation of faculty and other administrative agencies), long-range planning, development of operating standards, and appraisal of the effectiveness with which general policies are carried out in the several divisions and administrative units of the institution. This appraisal led to a series of recommendations, none of which involved legislative action or prerogatives, which are too detailed for comment here. The restudy also emphasized the importance of coordination within the university system and the avoidance of unnecessary duplication of high-cost specialized programs, particularly at the graduate level.

The same type of appraisal of the government and administration of the State-college system was made. This led to the conclusion that the State colleges cannot be effectively integrated under the present arrangement for their government. The 10 State colleges are by law under the control of the State board of education, which also supervises elementary and secondary education, issues and revokes teachers' credentials, and performs many other important and time-consuming duties. The members of the State board of education are appointed by the governor with the advice and consent of two-thirds of the senate. The board's executive officer and administrative head of the State colleges is the superintendent of public instruction, an elective official whose duties are even more numerous and demanding than those of the board. He administers the State colleges through the division of State colleges and teacher education of the State department of education, the chief of the division serving in effect as the superintendent's deputy.

The restudy concluded that in spite of the devotion and ability of those involved in the government and central administration of the State colleges, the present organization would be inadequate to the task of policymaking and administration of a complicated system of 10 or more institutions that would enroll at least 72,400 students, and probably more, by 1965. Therefore, the restudy recommended that there be created a new State college board composed of 9 members including the superintendent of public instruction and 8 other persons appointed by the governor and confirmed by the senate. It is recommended, also, that the new board be authorized to appoint a chief administrative officer to guide it in the development of policies and to take responsibility for their execution.

Convinced that the present liaison committee had been a useful agent for the coordination of public higher education, the restudy recommended that the voluntary method of coordination be continued, but that the committee should be composed of representatives of the State board of education, which should still provide leadership for the public junior colleges through a new bureau of junior college education; the new State college board; and the regents of the University of California. The survey staff proposed, further, that the legislature appropriate funds for a professional staff that would be directly responsible to the liaison committee. Finally, the staff suggested that when the liaison committee considers statewide educational problems of interest to independent institutions, it should invite representatives of these institutions to sit with it.

Expenditures

8. Expenditures of the public junior colleges, the State colleges, the University of California, and a number of independent institutions were analyzed under generally accepted categories. An attempt was also made to determine roughly the proportion of faculty service devoted to teaching, research, administration, and public service. This made it possible to compute expense per student credit-hour for instruction for each institution as a whole and at lower-division, upper-division, and graduate levels.

The expenditure data are too voluminous to present here. Those interested are referred to the complete report, which also includes a discussion of the limitations of unit-cost data and safeguards against their injudicious use. The chief limitation pointed out is that unit expenditures do not reflect the quality of the programs under study. "It should be emphasized," the report warns, "that economy and efficiency must be interpreted in terms of the product, not in terms of arbitrary or mechanical standards. If educational quality is sacrificed in the course of making changes in educational practice (on the basis of unit expenditure accounting) true economy and efficiency will have been decreased rather than increased."

The section on expenditures closes with an analysis of some factors related to costs, such as teaching load, class size, and extent of the course offering.

Ability To Support Higher Education

9. The survey staff offered a positive answer to the question, "Can California support the greater cost of higher education over the next decade?" In 1953–54 the total general and educational income of the university, the State colleges, and the public junior colleges from State and local governments amounted to about $115,512,400, a sum representing 0.468 percent of income payments to California individuals in 1953. It was estimated that approximately $226,974,000 will be required to provide for higher education in 1965 at a level comparable with 1953–54. However, if State and local governments were to supply the same percentage of estimated total income payments to individuals in 1965 as in 1953, they would provide only $189,573,000, or $37,401,000 less than the amount required.

The survey staff concluded, however, that an increase from 0.468 to 0.568 percent of income payments would more than provide the necessary support and would not represent an unreasonable increase in the burden of support for higher education. A tabulation of general expenditures of State higher educational institutions as percentage of per capita income in 1953 showed that 21 States exceeded California in the percentage of per capita income devoted to public higher education. If the sum furnished by the Federal government for Los Alamos and the Berkeley Radiation Laboratory had been subtracted from the California figures, California would have been exceed by 33 States.

The restudy therefore concluded that California will be able to support a comprehensive program of public higher education for the potential enrollment of 1965 comparable in scope and quality to that now offered without excessive demands on the State's financial ability or an unreasonable increase in the burden of taxation.

Strength To Meet Our National Need

The American Council on Education held a conference of the constituent members on March 19 and 20, 1956. President Eisenhower in a special message to Congress on January 12 had announced that he would appoint a President's Committee on Education Beyond the High School. The meeting was held for the purpose of giving the constituent members an opportunity to present to the President's Committee an analysis of the issues and problems in higher education for the Committee's consideration. The following statement was approved at the meeting.

Education Beyond High School

The developing culture and expanding economy of the United States, the complex social structure which characterizes its life, the demands of national defense, and the insistent emphasis upon opportunity for the individual together with a dramatically increased birth rate in the last two decades—all combine to raise fundamental questions about the place of education beyond the high school in our society. Hence the American Council on Education and its Constituent Member Organizations welcome the appointment by President Eisenhower of a committee on education beyond the high school. This action recognizes that American education faces the greatest crisis and the greatest opportunity in its history.

American culture owes its origin and vitality to spiritual, moral, intellectual, and artistic values. Our country will continue to depend on higher education for leadership in the preservation and cultivation of these values.

Demand for Education

An enormous demand for trained intelligence and moral character to meet a wide variety of requirements must be satisfied if our people are to continue to fulfill their personal aspirations and to contribute effectively to national aims and worldwide relationships. A wide diversity of knowledge and skills is needed by our dynamic economy. The demands for trained intelligence come from the professions and vocations, from business and industry, from government, from agriculture, from labor, from every identifiable segment of our society. To meet these demands the opportunity must be given to every American citizen to attain the highest level of education and training of which he is capable.

Education for All Levels of Ability

We must be concerned with individuals at all levels of ability. We must also provide educational opportunities over a continually increasing span of life. Hence, we must continue to develop new educational resources, diverse types of institutions, additional courses of study, and new techniques of instruction such as educational television.

Higher education will be called upon to supply an increasing number of persons with a wide range of skills and abilities, many of these in new fields resulting from the growth of technology, and from our Nation's closer relations with the rest of the world. Yet no matter how specialized their work, graduates of the future will have to find their way in a more complicated society, and will be confronted with complex human problems requiring the broader training associated with the liberal arts. The need for men and women trained in the various specialized fields and at the same time equipped with broad human understanding is certain to make a demand upon our society's reservoir of talents far greater than we are currently prepared to supply.

Areas of Special Federal Interest

Over and above the general claims of the American people and the economy, special demands are made on educational resources by the Federal Government in areas for which it has direct responsibility, such as national defense, international relations, agriculture, and public health. Military training programs, extending to more than three hundred campuses, are dependent on facilities predominantly furnished by the colleges. Research on problems directly related to defense make further heavy demands on the colleges for trained manpower and use of facilities. The successful conduct of international relations requires the promotion of mutual understanding through study courses and exchange of persons, the provision of technical assistance to foreign countries, and the training of personnel for all kinds of overseas service. Since the first days of the Republic, agricultural improvement has been recognized as a prime concern of the Federal Government. In recent years, medical research and public health services in general have been similarly regarded. In both fields the colleges are expected to play a major role, especially in providing professional

training for large numbers of people. These demands in total have a heavy impact on educational institutions.

More Qualified Students

Since this country's resources of manpower are limited in number, particularly in the 18- to the 24-year age group which supplies most of the students for institutions of higher learning, the welfare and security of our people as a whole may well depend upon the extent to which we are able to educate each young man and woman to his or her full capacity. It is an established fact that at least one hundred thousand young men and women each year with high qualifications for college and university education are not continuing beyond the high school.

How do we tap this pool of qualified students? The first task is obviously that of identification of those who should come. Though some efforts are being made, a complete and clear audit of the number and abilities of all our students from elementary grades on is required. The findings of such an audit must then be cooperatively used by all segments of education to identify those most qualified to continue.

Once identified, these students must be inspired to continue their educational development to insure the fullest satisfaction for themselves and their greatest potential service for the Nation. To achieve this result will call for good teaching and good guidance procedures at all levels of education, supported by cooperative effort in the local communities.

Opportunity for these students to continue their education to a level appropriate to their capacity must then be assured by adequate financial support. Not only should the American family put an even higher premium on education and give a higher priority to meeting the costs of that education, but larger numbers of additional scholarships must be provided, and all other forms of financial aid explored.

More Qualified Teachers

Even if strict standards of quality are applied to every type of education offered, enrollment of college students according to conservative estimate will double by 1965. The present teaching force of 190,000 would also have to be expanded proportionately if the present ratio of teachers to students were to be maintained. Other forms of post-high school education might require an even sharper increase figured on the same basis, since part-time enrollments, particularly of adults, are mounting more rapidly than the enrollment of full-time students. In view of the competing demands of Government, industry, the professions, and other levels of education for trained personnel, it is unlikely that enough teachers can be found to meet the needs of higher education on this theoretical basis. Nevertheless a very large increase in the faculties of colleges and universities will clearly be necessary. A corresponding increase of qualified administrators will also be required.

Society has a right to demand that teachers and administrators in all academic institutions be highly qualified because upon their work depends to a large extent the nature of our culture and our citizenship. Since the gifted teacher must have special personal qualities as well as rigorous training, the recognition and encouragement of able persons to enter the teaching profession becomes especially urgent. It is also essential that means be found to retain effective teachers in the profession until they have made their maximum contribution.

Organizations in the field of higher education, and a substantial number of colleges and universities themselves, sometimes in cooperation with secondary schools, are at work in planning and executing means to identify, encourage, and train a greater flow of competent recruits to faculty ranks. They are working to enhance teacher effectiveness through the use of teaching aids and the encouragement of greater initiative among teachers and students. They have plans to increase the available supply of teaching personnel by drawing upon the services of a larger proportion of women, and by utilizing persons who have passed the normal ages of retirement, whether in teaching or in other occupations.

From Government and from the public, we seek recognition of the critical importance of attracting into college and university teaching and administration more of the Nation's ablest young people. From society we ask increased respect for the teaching function. Perhaps the most important need is better understanding of the conditions of effective teaching, including full freedom of teaching and research, higher salaries, and greater personal and family security. Careful attention should also be focused upon the necessity of maintaining, in both publicly and privately supported institutions of higher education, administrative and academic independence and integrity.

(Continued on page 136)

Association for Higher Education Resolutions

THE Association for Higher Education, in its Eleventh National Conference on Higher Education, on March 7, 1956, adopted a series of resolutions, of which the principal ones are:

Teacher Shortage

In view of the growing shortage of qualified personnel to staff our colleges and universities, the Eleventh National Conference on Higher Education urgently recommends:

(1) That immediate attention be given to identifying the motivations which influence youth towards or away from college teaching and that institutions use this knowledge in the interests of more effective recruitment;

(2) That the graduate schools re-examine the appropriateness of their programs with the intention of improving the preparation of teachers;

(3) That individual institutions evaluate their personnel policies with a view to a more effective, expanded use of available human resources; and

(4) That society increase its support of colleges and universities in order to provide adequate salaries in higher education.

Efficient Utilization of Present Resources

Acutely aware that every possible physical resource must be explored and utilized if higher education is to meet its rapidly expanding responsibilities, and equally conscious of the justifiable concern of the various segments of society supporting higher education that present resources and facilities be used to the maximum degree compatible with effective educational results, the Eleventh National Conference on Higher Education urges every college and university to study and improve its current use of classroom, laboratory, and other facilities and to strive for the highest degree of economical operation attainable through sound administrative and financial procedures.

Intellectual Freedom

The Eleventh National Conference on Higher Education notes with satisfaction the improvement in the climate of opinion regarding intellectual freedom in America. Nevertheless, it views with concern the continuing threats to such freedom and urges that they be vigorously opposed so that the freedom of teaching, inquiry, and learning essential to the colleges and universities and to the national welfare may be preserved and strengthened.

Control of Publicly Supported Institutions of Higher Education

The Eleventh National Conference on Higher Education notes with growing concern the trend toward transferring the basic controls of higher institutions, especially publicly supported colleges and universities, from governing boards to central agencies of state governments. This conference urges cooperation by the Association for Higher Education and other interested agencies in the field of higher education in examining this trend and its implications in the interest of safeguarding the essential freedom of institutions of higher education.

State and Regional Planning

Recognizing that planning for the future of higher education cannot be adequately accomplished merely by individual institutions projecting their own future development, the Eleventh National Conference on Higher Education emphasizes the need of cooperative consultation and planning at the local, state, and regional level, and recommends that such studies, involving all elements of higher education both public and private, be adequately financed.

Foundation Support of Higher Education

The Eleventh National Conference on Higher Education records its appreciation to the many philanthropic foundations which have given generous financial support to higher education over the years, and particularly to the Ford Foundation for its recent magnificent grant of $260,000,000 to the privately controlled colleges and universities for the improvement of faculty salaries, and for its grant of $90,000,000 to American medical schools. This conference expresses its hope that the foundations, while continuing to support specific projects of benefit to higher education, will also recognize with appropriate support the growing need of grants for general purposes.

Corporate Support of Higher Education

The Eleventh National Conference on Higher Education records its appreciation for the significant financial contributions which corporations are making to institutions of higher education and it expresses its hope that corporations will provide continuing support to colleges and universities commensurate with the needs of these institutions and with their contributions to the advancement of American business and industry and to the general welfare.

Tax Credit for College Expenses

Because the increasing cost of attending both publicly and privately controlled institutions is limiting college opportunities for many of our young people well qualified for college, and since tax relief to families for expenses incurred in providing higher education for their children will somewhat reduce financial barriers to college opportunities, the Eleventh National Conference on Higher Education reaffirms its support of legislation providing a tax credit on payments of tuition and educational fees made to tax-exempt colleges and universities.

Extension of Educational Opportunity

The Eleventh National Conference on Higher Education expresses its grave concern over the large numbers of young people well qualified for higher education who fail to enter college, or, once enrolled, do not remain to graduate. It therefore urges that all means appropriate to overcome this serious waste of our resources of youth—whether due to lack of motivation, inadequate counseling or limited finances—be undertaken by the agencies

concerned with the education of youth and the national welfare. The Conference urges that special attention be given to the expansion of financial aid programs by business and industry, by foundations and individual benefactors, and by the state and Federal governments.

College and University Housing

Since there is a continuing critical need for the construction of college and university housing, dining, health, and student union facilities, the Eleventh National Conference on Higher Education records its approval of the present College Housing Loan Program under Public Law 475 and urgently recommends that this program be continued at an interest rate formula no higher than at present, that supplemental funds for administration of the program be appropriated, and that responsible officials take means to expedite the method of processing these loans.

Educational Benefits for Servicemen

The Eleventh National Conference on Higher Education recognizes that the world situation will require military service of a large number of our male youth for some years to come, with consequent dislocation of their normal plans for education. This conference recommends that the Congress enact legislation providing educational benefits comparable to those provided under Public Law 550 to individuals who have honorably completed their period of active military service.

Student Exchange

The Eleventh National Conference on Higher Education, mindful of the importance of student exchange in promoting world peace, recommends that colleges and universities increase the enrollment of foreign students despite the pressure of expanding enrollments.

Technical Assistance to Foreign Countries

The Eleventh National Conference on Higher Education reaffirms its support of university participation in the Government's cooperative programs, designed in the interest of national policy, to assist foreign countries in their economic, educational, and technical growth.

U. S. Office of Education

The mounting problems of higher education in America make mandatory in the national interest a stronger Office of Education, equipped, staffed, and financed to provide effective service to the colleges and universities and to the public. To this end it is urged that adequate funds be appropriated by the Congress of the United States.

Committee on Education Beyond the High School

The Eleventh National Conference on Higher Education commends the President of the United States for his establishment of a Committee on Education Beyond the High School. The Conference urges this committee to recommend the calling of a White House Conference on education beyond the high school, to be preceded by appropriate state and regional conferences.

Higher Education and Integration

The Eleventh National Conference on Higher Education commends the substantial progress which has been made at many colleges and universities in providing educational opportunities for qualified persons without regard to race, creed, or place of national origin. The Conference recognizes that integration must be achieved over a period of time by states, communities, and institutions in the light of existing and evolving social relationships. With this in mind colleges and universities are urged to approach the problems involved and through wisdom and understanding to work toward integration in the interests of social justice and national unity.

Executive Committee Action

After the meeting closed the Executive Committee of the association endorsed the idea that continued planning for the future development of higher education is a necessity. Such planning, it said, should be on a statewide and regional basis, and should give due consideration to the contribution that may be made by both publicly and privately controlled institutions of higher education. It requires adequate financing and competent staff members.

Planning is particularly necessary at this time both in order to make certain that adequate facilities will be available for students to obtain higher education in the future, and in order that the necessary facilities may be provided in the most economical manner.

Harvard Tuition Increase

TUITION in Harvard College will be increased from $800 to $1,000 beginning with the academic year 1956–57. Tuition in the Graduate School of Arts and Sciences, the School of Public Administration, and the Graduate School of Education will be increased at the same time from $700 to $800. Corresponding changes will be made in the tuition charges for undergraduates and graduate students in Radcliffe College.

Harvard College tuition was $400 from 1929 to 1948; $525 for the year 1948–49; $600 from 1949 to 1953; and $800 from 1953 to 1956. Increasing the tuition from $800 to $1,000 means raising the average student's college bills at Harvard for board, room, tuition, and fees, from $1,700 to $1,900 a year.

Harvard College is currently awarding some $850,000 in scholarship awards to about 1,100 students, approximately one-quarter of the undergraduate enrollment. Loans to students amounting to $200,000 a year are being granted to more than 500 undergraduates, without interest until completion of college and graduate studies. The college is also assisting 1,500 undergraduates each year in finding jobs during the term, to help pay their way. All these financial aid programs will be increased to help the students meet the new expense.

Obstacles To Planning in Higher Education

By B. LAMAR JOHNSON*

The interest in planning higher education for the future is today very widespread. The writer has recently, through an extensive motor trip to some 50 colleges and universities in 20 States in all sections of the country, had opportunity to observe what is being done to provide for the sharply increasing number of young people who will soon seek admission to college. He conferred with college and university presidents, deans, and professors; with members of boards of control and of commissions studying higher education; with State superintendents of public instruction, congressmen, governors, and members of State legislatures; and with other citizens. He here records some of his observations.—EDITOR.

Need for Planning

It is now widely known that there will soon be a sharp rise in the number of college-age youth. This fact, coupled with the continually increasing percentage of young people who go to college, is expected to result in doubling college enrollments during the next 10 or 15 years. As was shown by Hollis and Martorana in the March 1956 number of *Higher Education*, a goodly number of States recognize the situation and are taking steps to provide for it, but other States are apparently doing little about it at present. The following sections indicate several obstacles that stand in the way.

Planning Is Considered Unnecessary

In a number of States the prevailing attitude toward planning for higher education can be simply and succinctly stated: It simply is not necessary. The ultimate expression of this viewpoint came from a governor who commented, "Mr. Johnson, I am not much worried about how we will care for the sharp increase in college-age population. The American people have a way of meeting crises when they arise. The emergency, if such it should prove to be, will in good time be faced and met by our citizenry."

This attitude, to a greater or less degree, apparently characterizes the thinking of citizens, legislative leaders, and even educators in several States where a "do nothing" policy is currently being followed.

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Planning Is Easy

The president of a great State university espoused the view that planning is easy, as he explained, "This matter of planning is really not as complex as some people would have us believe. In most cases costly and extensive studies are not needed. Actually you and I, Mr. Johnson, could sit down and in an afternoon develop and agree upon a plan for higher education in this State—and one that would in all essential respects be as valid as the results of a 1- or 2-year survey conducted by a sizable salaried staff."

This viewpoint is further reflected in the relatively small appropriations typically made by legislatures for State planning. As one educator points out, "State funds that have been made available for such studies are illustrated by Ohio, $15,000; Michigan, $25,000; Illinois, $60,000. For preliminary plans for one building architects' fees may run $100,000, and legislatures do not hestitate to appropriate the funds. But for these more fundamental studies relating to the education of youth, they do not understand the need for larger sums."

Occupation With Immediate Problems

Officials have said, "We are fully occupied with the immediate problems and needs of our elementary and high schools." This reason for failing to plan for higher education recently received credence at the national level when higher education was omitted from the program of the White House Conference on Education. The conference committee did not belittle the importance of planning for the colleges and universities, nor did they suggest that such planning is easy. Quite the contrary. The committee took the view that the immediate problems of elementary and high school education are so pressing and of such magnitude that they require priority—and that the inclusion of higher education in the deliberations of the conference would of necessity detract from the effectiveness of the consideration given to the needs at other levels of schooling.

Rivalry Among Institutions

In some places it is difficult to plan because of the rivalry among institutions of higher education in the State. Now, as seldom before in the history of the nation, unity, cooperation, and coordination of efforts are demanded of all institutions of higher education. At a time when college enrollments are about to overtax all available facilities (private as well as public; universities and junior colleges; teachers colleges and colleges of liberal arts) and require vast additions to plant and staff—as well as the establishment of some new institutions—it is indeed unfortunate if rivalry between colleges and universities can be permitted to become an obstacle to planning for the future. And yet this is exactly what is happening in some States. Representative effects of competition include these:

a. One governor reported a need for statewide planning in higher education. "My office should be taking the initiative in recommending the establishment of an agency to make studies designed to identify the future requirements of our State in higher education and to make recommendations for meeting them. I recognize the exigencies of the situation and am willing, in fact eager, to act. But a move on my part at this time would be ill advised. The value of any investigations made would depend upon the cooperation of all collegiate institutions within the State. Such collaboration, I am constrained to conclude, cannot at present be achieved between the public and private colleges of our commonwealth." Visits with the administrators of representative public and private institutions of higher learning within this State lead the writer to agree with the governor's conclusion.

b. In a second State, rivalry between two public universities has become such a dominant factor in the thinking of educators, legislators, and lay citizens that the projection of plans for higher education is, and threatens to remain, at a virtual standstill.

c. At a recent legislative session in one State, a committee representing private colleges appeared before a senate finance committee to oppose an appropriation bill which would have provided additional funds for several tax-supported colleges. Grounds for opposition were that the expansion and improvement of these public colleges, in which tuition charges are low, would attract the interest of students who would otherwise attend private institutions. This particular incident occurred in a State which anticipates a doubling of its college enrollment during the forthcoming 10 or 15 years—a growth which will tax to the limits the facilities of existing institutions, require their expansion, and possibly require the establishment of one or more new colleges.

d. A university president expressed himself as opposed to cooperative planning because he could not depend upon all of the administrators of other institutions in his State to live up to agreements into which they had entered. "On several occasions," he asserted, "our colleges and universities have developed plans and entered into agreements regarding, for example, our functions and the scope of our programs. More than once the opportunistic head of an institution has violated promises and engaged in activities which have proved detrimental to the university which I serve. I propose to have nothing to do with cooperative planning until we can be assured of integrity within our profession."

It is difficult, indeed, to understand how effective preparation can be made for tomorrow, if colleges and universities cannot themselves put aside rivalries and vested interests and together work in the cause of meeting the demands of the youth and of the Nation.

In Conclusion

Such are some of the obstacles that have been found which stand in the way of planning to meet the increasing demand for higher education as they have come to the attention of the writer. It is disheartening indeed that they should hinder or delay the taking of necessary steps before the situation becomes overwhelming.

Stanford General Studies Program

STANFORD UNIVERSITY has revised its undergraduate curriculum following a 2-year appraisal of its undergraduate study program by faculty committees. The study was supported by grants from the Ford Foundation and the Carnegie Corporation of New York. The result is a new General Studies Program, which will require from 3 to 4 years to put into effect.

The Program

Highlights of the new General Study Program include:

1. Entering students to receive up to 15 units (180 required for A. B. degree) for college-level courses taken in high school.

2. Requirement of a full year of freshman English, to include both composition and literature.

3. The student to be automatically freed from required general studies courses in his major field—natural sciences, social sciences, or humanities. For example, the science major need not take required general studies courses in science and may use the additional time for further studies in the other two fields.

4. Several departments of the social sciences to develop new "terminal courses" designed to familiarize students with these studies, but not necessarily to prepare them for further courses in that field. There will be no "prerequisite courses" for a terminal course.

5. The student to be allowed to satisfy a portion (up to four units out of six) of the physical education requirement by participating in organized activities such as band, orchestra, chorus, and dramatic productions.

6. Students for the A. B. degree who elect foreign language under the general studies language-mathematics option to be required to take an additional four units of foreign language reading, a course in mathematics, or a course in logic.

7. Course requirements in natural sciences to be raised 2 units to a total of 17 for graduation with the A. B. degree, in recognition of the growing importance of the natural sciences in the life of the individual citizen.

8. "Colloquia" in two departments outside of the major department to be required during the senior year, in which small groups of students will discuss current problems in the light of their studies. These colloquia will not be required for interdepartmental honors program students, or for students who take their first year of law or medical school as their senior year of college.

9. Every student to be permitted to declare his major as a freshman if he so desires, and to be required to do so at the beginning of his junior year.

10. Each student to have "absolute freedom" in changing advisers or fields of study in order to avoid actual or imagined psychological barriers to his choice.

11. A permanent committee to be appointed for direction and review of the new General Studies Program, with power to "cancel" existing courses in the program if they fail to meet its needs or to recommend improvements in the program.

Entrance Requirements

New entrance requirements have been enacted, which will become effective gradually. They include:

1. An increase from 2 years of high school English to 3, plus 2 years of foreign language and 2 of mathematics. Exact fulfillment of these prerequisites may be waived in cases of exceptional scholarship.

2. Satisfactory performance on subject-matter achievement tests in addition to the present College Board Scholastic Aptitude Test.

Strength To Meet Our National Need

(Continued from page 131)

Expanded Facilities

With the present record-breaking total of 3,000,000 college students likely to double by 1965, the need for expanded facilities will be proportionate unless more effective use can be made of present buildings and equipment. One authority estimates construction costs of approximately 13 billion dollars over the next 10 years, or almost double the present rate of expenditure for this purpose, even though all the institutions involved take responsibility for rigorous self-examination to make sure of the maximum use of present facilities, and participate in statewide, regional, and national planning to achieve coordination and consequent economy in the use of educational facilities.

Base of Financial Support

It is clear that provision of educational opportunity for all qualified youth, recruitment and maintenance of adequate faculties, and necessary expansion of educational facilities—all for the purpose of meeting clearly present or foreseeable needs of our society—will call for an increase in funds large in amount but small in proportion to our total national income. It is not so clear what proportions of these funds should be supplied by available sources, such as increases in tuition, individual gifts, corporate contributions, and appropriations by local, State, and Federal Governments. We urge The President's Committee to study this problem and to make appropriate recommendations to the American people. We are confident that when the need is understood, the people will support a sound program of action to supply the essential funds.

Institutions Reporting Curriculums in Recreation Leadership*

RECREATION has in recent years become a field of specialized study in a number of colleges and universities. An extensive 2-year study of recreation and leadership training needs conducted by the Southern Regional Education Board and the National Recreation Association revealed that professional workers in this field in the South tripled between 1940 and 1950 and that by 1952 the increase was fourfold. This rate of increase is expected to continue, for the employers at the time of the study said that they expected to add 3 new and additional workers for every 4 that they had on the job at that time.

In the public field, more cities organized full-time, year-round departments with professional personnel in charge in the 7-year period 1945–52 than they had established in the preceding 35-year period. Of the city managers, mayors, and commissioners in the cities not yet organized for full-time, year-round recreation service questioned, 75 percent indicated that by 1957 they expected to have full-time programs.

The increase in the voluntary youth-serving agencies and institutions has also been impressive. Recreation positions, particularly in such institutions as the mental hospitals, are developing rapidly. For recreation as a whole, the need for personnel exceeds the supply of qualified people.

The colleges and universities listed below reported major curriculums for training recreation leaders to the National Recreation Association. (The asterisk indicates that a correspondence course is offered in recreation.)

CALIFORNIA
- College of the Pacific, A. B., B. S.
- Los Angeles State College, A. B.
- Mills College, A. B.
- Sacramento State College, A. B. (recreational therapy)
- San Diego College, A. B.
- San Francisco State College, B. S.
- San Jose State College, A. B.
- University of California, A. B.

CALIFORNIA—Continued
- University of California at Los Angeles, B. S., M. S.
- University of Southern California, A. B., B. S., M. S., Ph. D.

COLORADO
- University of Denver, A. A., A. B.

FLORIDA
- Florida State University, B. S., M. S. Ed.
- University of Florida, B. S.

GEORGIA
- Mercer University, B. S.

HAWAII
- University of Hawaii, B. S.

ILLINOIS
- George Williams College,* B. S., M. S.
- University of Illinois, B. S., M. S.

INDIANA
- Indiana University,* B. S., M. S., Re. Dir., Re. D.
- Purdue University, B. S., B. P. E., M. S. Ed., B. P. E. (remedial P. E.)

IOWA
- State University of Iowa, A. B. (women)

KENTUCKY
- University of Kentucky, A. B.

MARYLAND
- University of Maryland, B. S., M. A., M. Ed., Ed. D., Ph. D.

MASSACHUSETTS
- Boston University, B. S., Ed. M., Ed. D.
- Springfield College, B. S., M. Ed.
- University of Massachusetts, B. S., M. S.

MICHIGAN
- Michigan State University, B. S., M. A.
- Wayne University, B. S., M. Ed., M. A.

MINNESOTA
- University of Minnesota,* B. S., M. Ed., M. Ed. (hospital recreation)

MISSISSIPPI
- Delta State Teachers College, B. S.
- Mississippi Southern College, B. S.

MISSOURI
- Northeast Missouri State Teachers College, B. S., B. S. Ed.

NEW YORK
- Ithaca College, B. S.
- New York University, B. S., M. A. Ed., M. A. (hospital recreation), Ph. D.
- State Teachers College, B. S., M. S.

*Contributed by W. C. Sutherland, Personnel Service, National Recreation Association, 8 West 8th St., New York 11, N. Y. Additional information on training for recreation service may be obtained from the association.

NEW YORK—Continued
Syracuse University, B. S., M. S.
Teachers College, Columbia University, B. S., M. A., M. A. (recreation in rehabilitation), Ed. D., Ph. D.
Utica College of Syracuse University, B. S.

NORTH CAROLINA
Bennett College, B. S.
North Carolina College, B. S., M. A.
North Carolina State College, B. S.
University of North Carolina,* A. B., M. A.
Woman's College of the University of North Carolina, A. B., B. S., M. A.

OHIO
Ohio State University, School of Social Administration, B. S., M. S. A.
Ohio Wesleyan University, A. B.

OREGON
Oregon State College, B. S.

PENNSYLVANIA
Pennsylvania State University, B. S., M. S., Ph. D., Ed. D.
Temple University, B. S., M. S. Ed., Ed. D.

TENNESSEE
University of Tennessee, A. B., M. S.

TEXAS
North Texas State College, B. S. in P. E., M. S. in P. E.
Texas State University for Women, A. B., B. S., M. A.
Texas Technological College, B. S.

UTAH
University of Utah, B. S., M. S.
Utah State Agricultural College, B. S., M. S.

VIRGINIA
Richmond Professional Institute, College of William and Mary, B. S., M. S.
Virginia State College, B. S. Ed., A. B.

WASHINGTON
Central Washington College of Education, A. B.
State College of Washington, A. B., M. A.
University of Washington, A. B.

WEST VIRGINIA
West Virginia University, A. B., M. S.

WISCONSIN
Wisconsin State College, Milwaukee, B. S., A. B.
Wisconsin State College, La Crosse, B. S. in P. E. (recreation)
University of Wisconsin,* B. S., M. S. Ed.

Business Management Workshop

THE UNIVERSITY OF OMAHA has announced its seventh annual workshop in college business management to be held July 22–28. It offers a variety of courses which provide undergraduate and graduate credit.

Summer Institutes for Teachers of Science and Mathematics

TWENTY-TWO GRANTS designed to point the way to improved teaching of science and mathematics in the Nation's high schools and colleges have been made by the National Science Foundation. The grants, totaling more than a million dollars, have been awarded to colleges universities, and professional societies for the purpose of conducting institutes led by outstanding scientists, engineers, and mathematicians for high school and college teachers in these fields. Twenty of the grants are in support of summer institutes to be held in 1956. Two of the grants are for experimental institutes to be conducted throughout the academic year 1956–57.

The Foundation program, now in its fourth consecutive year, is an experiment designed to stimulate, through demonstration, the creation of opportunities for college and high school teachers to attend courses in science and relevant fields especially designed for teachers and conducted by leaders noted not only for competence in their fields but for skill in presentation.

Grants for summer institutes will provide financial assistance to more than 1,000 participating teachers, approximately 50 at each institute, and additional allowances for dependents. Grants for the academic-year institutes will provide stipends of $3,000 each to 50 teachers in each institute. Additional allowances for dependents will also be provided.

Ten of the summer institutes are for high school teachers of science; seven are for college teachers only; and four are open to both high school and college teachers. The academic-year institutes are for high school science teachers only.

One of these training programs will be offered at the Oklahoma Agricultural and Mechanical College from September 1, 1956, to May 31, 1957. It is open to high school teachers of science with 3 or more years experience and to others able to profit by the program and qualify as science teachers.

The National Science Foundation will continue the summer institutes in the summer of 1957. Proposals from colleges, universities, and professional societies for support of 1957 summer institutes should be received by the Foundation no later than September 1, 1956. Inquiries should be addressed to: Program Director for Education in the Sciences, Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D. C.

NEW PUBLICATIONS

Government Publications

How To Obtain

(*1*) *Cost Publications: Send request, enclosing remittance (check or money order), to the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.*

(*2*) *Free Publications: Request direct from the agency issuing them.*

From the Office of Education

Administration of Public Laws 874 and 815: 5th Annual Report of the Commissioner of Education, June 30, 1955. Washington, D. C., U. S. Government Printing Office, 1956. 122 p. 65 cents.

Distributive Education for Adults: Selection and Training of Part-Time Instructors. Washington, D. C., U. S. Government Printing Office, 1956. 28 p. 25 cents. (Vocational Division Bulletin No. 258—Distributive Education Series No. 20.)

Education Directory 1955–56, Part 3, Higher Education, by Theresa Wilkins, U. S. Government Printing Office, 1955. 174 p. 50 cents.

Fall 1955 Statistics on Enrollment, Teachers, and Schoolhousing in Full-Time Public Elementary and Secondary Day Schools, by Samuel Schloss and Carol Joy Hobson. U. S. Government Printing Office, 1956. (Circular No. 467 Revised.) 8 p. 15 cents.

Selected References on School Finance, by Albert R. Munse and Edna D. Booher. U. S. Government Printing Office, 1956. 42 p. 35 cents. (Circular No. 462.)

Non-Government Publications

Obtain direct from the publishers. Prices are indicated when known

Adults Grow in Brooklyn, Report No. 2: The Brooklyn College Experimental Degree Project for Adults, by Bernard H. Stern. 940 East 58th St., Chicago 37, Ill., Center for the Study of Liberal Education for Adults, 1955. 51 p. Proc.

Ancient Education, by William A. Smith. New York, N. Y., Philosophical Library, 1955. 309 p. $3.75.

Cultural and educational development of the Mesopotamians, the Egyptians, the Indians, the Chinese, the Greeks, the Romans, and the Hebrews.

A Second Look at the College of St. Scholastica: A Report of the Graduates of the College 1941–1951. Duluth, Minn., College of St. Scholastica, 1955. 140 p.

College Board Scores No. 2, by Henry S. Dyer *and* Richard C. King. P. O. Box 592, Princeton, N. J., College Entrance Examination Board, 1955. 192 p. $1.50.

Explains basic principles and techniques of testing, showing how they may be applied to local situations. Includes current data on student performance and information relating test scores to student interests, experience, and other background factors; also extensive data on enrolled students.

Faculty Organization at Rutgers, by G. Stuart Demarest and *The Basic Program at Chicago*, by Galway Kinnell: One of a Series on New Directions for University Adult Education. 940 East 58th St., Chicago, Ill., Center for the Study of Liberal Education for Adults, 1955. 47 p. Proc.

Graduate Education for Women: The Radcliffe Ph. D. A Report by a Faculty-Trustee Committee. Cambridge, Mass., Harvard University Press, 1956. 135 p. $3.50.

A profile of the Radcliffe Ph. D.; a discussion of who should go to graduate school; a statement concerning the faculty, the dean, and the student; a chapter on the financing of graduate education; and a look into the future. Radcliffe College confers more Ph. D.'s on women than any other institution in the United States with the exception of Columbia University and the University of Chicago.

The Graduate School Today and Tomorrow: Reflections for the Profession's Consideration. By F. W. Strothmann on behalf of the Committee of Fifteen. 655 Madison Ave., New York 21, N. Y., Fund for the Advancement of Education, Dec. 1955. 42 p.

How Much Does Adult Experience Count? A Report of the Brooklyn College Experimental Degree Project, by Bernard H. Stern. 940 East 58th St., Chicago, Ill., Center for the Study of Liberal Education for Adults, 1955. 23 p. Proc.

An Investigation of Closed-Circuit Television for Teaching University Courses, by C. R. Carpenter and L. P. Greenhill. Instructional Television Research Project Number One. University Park, Pa., The Pennsylvania State University, 1955. 102 p.

Introduction to American Public Education, by Chris A. DeYoung. New York, N. Y., McGraw-Hill Book Co., Inc., 1955, 3rd ed. 604 p. $5.50.

A thoroughly revised edition of a book originally published in 1942. Includes a unit of 40 pages on higher education.

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New York Establishes A State University: A Case Study in the Processes of Policy Formation, by Oliver Cromwell Carmichael, Jr. Nashville, Tenn., Vanderbilt University Press, 1955. 415 p. $5.75.

Analyzes and explains the steps—executive, legislative, and civic—by which the State of New York modified its traditional system of higher education by establishing a State university which consists of numerous institutions distributed throughout the State. Prior to the establishment of the State university New York was unique among the States in having no publicly owned and operated institution of higher learning, other than teachers colleges, and in depending upon public arrangements with privately controlled institutions to meet the needs in this field of education.

Open Doors; A Report on Three Surveys: Foreign Students in U. S. Institutions of Higher Education; Foreign Faculty Members at U. S. Colleges and Universities; Foreign Doctors Training at U. S. Hospitals. New York 21, N. Y., Institute of International Education, 1954–55. 56 p. Paper, 50 cents.

Philanthropic Foundations, by F. Emerson Andrews. New York, N. Y., Russell Sage Foundation, 1956. 459 p. $5.

Describes the various types of foundations now in existence, with estimates of their assets and current expenditures. Indicates the legal forms of foundations, the problems of tax exemption, the handling of investments, and the composition of boards, and presents extensive information on many phases of the policies and practices of foundations. This is the sixth in Russell Sage Foundation's series on foundations and philanthropy.

Religion and Public Higher Education, by Howard W. Hintz. Brooklyn, N. Y., Brooklyn College, 1955. 62 p.

The Responsibility of Higher Education for Helping To Develop International Understanding: A Series of Papers Presented at the Annual Meeting of the American Council on Education, October 6, 1955, Together with a Summary of the Subsequent Discussion. Washington, D. C., American Council on Education. Paper, 22 p. 25 cents.

Student Life and Higher Education: A Conference for Visiting Fulbright Scholars at Swarthmore College, Swarthmore, Pa., Willis D. Weatherford, *ed.* Swarthmore, Pa., Swarthmore College, June 1954. 80 p. Free.

The University Library: The Organization, Administration, and Functions of Academic Libraries, by Louis Round Wilson and Maurice F. Tauber. New York, N. Y., Columbia University Press, 1956, 2nd ed. 641 p. $7.50.

A thorough and up-to-date treatment of the theory and practice of college and university library administration. Number 8, Columbia University Studies in Library Science.

The Tasks of the Center: The Seventh Interim Report submitted by the Center's Board of Directors on October 1, 1955, by John B. Schwertman. 940 East 58th St., Chicago, 37, Ill., The Center for the Study of Liberal Education for Adults, 1955. 70 p. Proc.

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MARION B. FOLSOM, Secretary of Health, Education, and Welfare
SAMUEL MILLER BROWNELL, Commissioner of Education
LLOYD E. BLAUCH, Assistant Commissioner for Higher Education

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